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Does firm performance increase with risk-taking behavior under information technological turbulence?

Empirical evidence from Indonesian SMEs

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Abstract

Purpose – This paper aims to contribute to the risk management studies in small and medium enterprises (SMEs) by examining the complicated relationship between risk-taking behavior and firm performance.

Design/methodology/approach – The study conducted a survey of the Indonesian SME owner-managers and used partial least square structural equation modeling to examine the mediating effect of pricing capability and moderating effects of information technological turbulence.

Findings – The results do not only confirm the positive impact of risk-taking behavior on firm performance but also identify that impact of risk-taking behavior on firm performance is more effective at the low information technological turbulence than at the high one.

Research limitations/implications – This study relied on information from the owner-managers in SMEs, which may bias against the perspective of their employees and the business partners.

Originality/value – This study advances the risk-taking behavior research in SMEs context by introducing the effect of pricing capability and information technological turbulence.

Keywords Firm performance, Small business, Pricing capability, Risk governance, Risk-taking behaviour, Information technological turbulence

Paper type Research paper

Introduction

It is widely undisputable in business research and practices that risk governance contributes to firm performance by a combination of risk and return (Stein and Wiedemann, 2016). However, it is often difficult to encourage the decision makers at the firm level with a strong entrepreneurial orientation to pursue the high-risk strategies to achieve the best performance (Covin and Wales, 2012). Under information technological turbulence, many managers believe that they are not ready to take a risk by allocating resources to the social media (IBM, 2016).

The risk-taking behavior generates various outcomes, which need further investigation to pursue a better understanding of condition under which firm involvement is risk-enhancing or risk-diminishing (Hiebl, 2013). Risk governance is a set of mechanism, strategy or regulatory policy, which concerns the risk-taking behaviors (Justo-Hanani and Dayan, 2015). The members of managerial board tend to have conflicting interests regarding how much risk the company will bear (Bosse and Phillips, 2016). The fact shows that risk management still carries contradictions and raises some problems related to the selection of appropriate time intervals for risk identification and risk control (Stein and Wiedemann, 2016).

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Business in small and medium enterprises (SMEs) is associated with a high-risk business due to lack of access to resources, which simultaneously increase the risk (Schilke, 2014). The practices of risk governance in SMEs are very informal but a very proactive approach from identifying a possible source of uncertainty in estimating the potential impact of a risk (Falker and Hiebl, 2015). The risk governance of SMEs represents their capability to deal with business environmental turbulence (Stein and Wiedemann, 2016), which also becomes the essential element of entrepreneurial orientation (Miller, 1983; Lumpkin *et al.*, 2009; Pratono and Mahmood, 2015).

SMEs with lack the price capability are more likely to miss market opportunities, resulting in low performance and increased firm risk (Vorhies *et al.*, 2011). Understanding how accurately risk-behavior is performed effectively in SMEs is not only useful for academia but also for SME practice. However, lack of empirical findings concerning the implementation of risk management strategies at SME context raises a question of how risk behavior effectively performs (Falker and Hiebl, 2015).

This article aims to explore the complicated relationship between risk-taking behavior and firm performance by examining the moderating effect of technological turbulence. The model pertains to the mediating role of pricing capability, which is essential to the SMEs' chance of survival. This study carried out a survey of SMEs in Indonesia, which was a home for SMEs and more than 3.7 million of them conducted online business (Indonesian Ministry of Communication and Informatics, 2017). The Indonesian Ministry of Cooperative and Small Medium Enterprise 2015 provided the population data of registered micro, small, and medium enterprises. The directory classified a firm as a small-sized enterprise if their sales were between Rp300m and Rp500m per annum (around US$30,000 and US$50,000).

This study considers the heterogeneity of the observed firms by clarifying the analogy of SMEs. Project generation by similarity is widespread in business and management research by selecting a topic is the first step in setting up a research project (Curran and Blackburn, 2001). There is a potential problem that springs from the heterogeneity of SMEs in which the governance in risk-taking behavior involves triumvirate of power and control – owners, directors and executives (Karoui, 2017). Hence, this study focuses on small firms with managerial governance was under the owner-managers. This means that the administrative management relies on the owners who also work as managers.

Literature review

From risk governance to risk-taking behavior in small and medium enterprises

Risk-taking behavior refers to the firms' willingness to seize opportunity under the uncertain business environment (Covin and Wales, 2012; Baule and Fandel, 2016). The concept is different from reckless, which refers to the poor risk-awareness. Risk-taking governance relies on risk awareness and decision to go through with a choice in R&D, cash holding, and diversification strategy (Scordis, 2012; Francis *et al.*, 2017). The risk-taking behavior related to knowledge exchange fosters the complementary forms of governance (Garcia-Perez-de-Lema *et al.*, 2017).

The practical risk management requires the excellence risk governance, which involves the board with the enterprise-wide approach rather than treating each business unit individually (OECD, 2014). The success of risk management in performing its function depends on the corporate environment and the capability to shape the environment (Stulz, 2015). SMEs are prone to overlook risky choice that brings about good outcomes (Hess and Conttrell, 2016). However, SME heterogeneity raises a problematic for policymakers to understand the how the governance contributes to the decision-making process (Karoui, 2017).

The size factor provides a healthy relationship with an effort to allocate resources for innovation (Covin and Wales, 2012). SMEs that are motivated by creativity with the aim to create their product tend to take a strategic decision-making, such as being the first to market, offering new and unique products, and taking calculated risks (Campbell and Park, 2017). Social relationship plays a pivotal role for SMEs' decision-making process and bank preference to support their business opportunities (Hill and Scott, 2015). Besides, the adoption of social information systems has also given rise to new capabilities that have changed the way of SMEs to generate valuable innovation (Limaj *et al.*, 2016).

On the other hand, the governance mechanisms in SMEs are relatively weak, whereas the operating risk remains to focus on cash holdings (Al-Najjar, 2015). Falker and Hiebl (2015) indicate that there is an informal practice of risk governance in SMEs. In SME governance practice, the patterns of trust between managers change over time as the working relationships rely on the "knowledge-based" level of trust (Boxer *et al.*, 2012). SMEs tend to rely on trade credit financing provided by suppliers to facilitate the transaction when they experience difficulty in accessing bank financing, which implies on higher risk (McGuinness *et al.*, 2018). Under stiff competitive market, SMEs challenge to manage price-setting power unless they differentiate from other firms (Branguinsky and Hounshell, 2016).

Hypothesis development

The conventional theory of risk-taking incentives argues that entrepreneur entails with a risk taker, which implies better performance (Willebrands *et al.*, 2012). By investing money in their small firms, the entrepreneurs expect to gain benefits of the investment decision, which translates into a willingness to take risks associated with the investment (Block *et al.*, 2015). The outcome is related to the typical components of the self-interest assumption, such as cost, return and risk (Bosse and Phillips, 2016).

SMEs are a high-risk business, while larger firm size can enhance capacity to access to more resources while simultaneously lowering risk (Schilke, 2014). SMEs with simple organization structure will be more flexible at responding to the dynamic environment but less profit due to small economies of scale (Falker and Hiebl, 2015). The long-term orientation strategy leads SMEs to become the risk takers by leveraging their management capabilities more effectively (Zellweger and Sieger, 2010; Situmeang *et al.*, 2016).

On the other hand, risk aversion refers to firm behavior that pertains to avoid the risk and to settle within the comfort zone (Lichtenthaler and Muethel, 2012). The principle of loss aversion argues that individuals will be risk-averse since they wish to avoid the possibility of losing the gain they believe they are benefiting from (McKinley *et al.*, 2014). Firms may gain a higher expected profit when there are fewer rival firms near its position (Ross, 2014). Hence, firms with a risk-averse strategy tend to get lower expected profit (Zhao and Zhu, 2017).

SMEs tend to be reluctant to allocate resources to knowledge-building activities, which might help to mitigate such knowledge risks (Falker and Hiebl, 2015). The owner-managers fear that their future profits become at risk from the unpredictable business environment (Ding *et al.*, 2016). They prefer to delay hiring or deploying resources, which give rise to the "wait and see" behavior (Schreft *et al.*, 2005). The "wait and see posture" implies delayed decision-making process, which was taken at the right time, especially when the decision makers consider the worst scenario (Altinay and Wang, 2011):

H1. Risk-taking behavior has a positive impact on firm performance.

Pricing capability refers to firms' ability to set a price for their product to make a profit without losing any customers to competitors (Murray *et al.*, 2011). The capability lies in

scale economies, which implies in efficiency (Lira *et al.*, 2012). The competitive market tends to drive SMEs into pursuing a price competition strategy by matching competitors' offerings at lower prices (Murray *et al.*, 2011). The pricing capability of SMEs indicates that they sell their products at or below marginal costs to attract customers (Brush *et al.*, 2012).

SME is a price taker at the highly competitive market along with their lack of capability to bargain the input price or output level (Gonçalves and Barros, 2013). The SMEs with lack the price capability will miss market opportunities, resulting in low performance and increased firm risk (Vorhies *et al.*, 2011). The risk-taking behavior arises when firms' decision to establish the price (Dai and Meng, 2015). The regular price sensitivity of such products is lower in categories with a high premium price (Bezawada and Pauwels, 2013). In the financial sector, the firms with the robust capability to set a price tend to take conservative behavior (Tabak *et al.*, 2015).

Firms with higher risk-taking behavior encourage their salespeople to leads to a high degree of delegation of pricing authority for price discounting (Homburg *et al.*, 2012). Pricing capability is possible in a situation where firms can control the price for a group of customers with market access agreements (Persson and Jönsson, 2016).

Pricing capability becomes one of the primary determinants of firm performance (Homburg *et al.*, 2012), reflects firms' expectation that customers' intention to experience a new product regardless of the price paid (Lukas *et al.*, 2013). The behavior is about how to deal with consumers, who may be unemotional about cost in the purchase decision (Aydinli *et al.*, 2014). Pricing capability with the inclusion of transfer payments may allow firms to establish more competitive prices to attract higher quality partners or conversely (Mindruta *et al.*, 2016):

H2. Pricing capability mediates the relationship between risk-taking behavior and firm performance.

The comparison of risks and benefits is also used to understand the immature capability of SMEs to adopt IT technology (Kim *et al.*, 2016). Along with weaker R&D capability and fewer resources, SMEs recognize the low-risk technological arbitrage opportunities with imitable technology complexity (Shin and Lee, 2013). SMEs with firm intention to seize business opportunities will achieve high performance under predictable technological turbulence (Pratono, 2016).

SMEs with limited technological and market knowledge may fail to achieve the performance due to lower R&D expenditures and limited product diversification (Lichtenthaler and Muethel, 2012). SME owners that reluctant to allocate resources experience a direct loss of control over their networks and resources (Grant *et al.*, 2014). The driving force behind risk governance lies within the changed risk structure in business dynamics (Stein and Wiedemann, 2016). Under tremendous technological turmoil, effective risk management continues to be critical for organizations choosing to innovation for growth and competitiveness (Ali *et al.*, 2017).

SMEs lack investment capital and IT capabilities; thus, they cannot tolerate performance and security risks (Kim *et al.*, 2016). When the technological turmoil is high, the firms experience a low performance than when technological turbulence is low (Carbonell and Escudero, 2015). Under high technological turmoil, SMEs are vulnerable to various risks, including the cybercriminal, malware, spam and distributed denial of service (Eling and Schnell, 2016). The increasing risk due to environmental uncertainty leads firms to adopt a "wait and see" policy, such as hiring new employees until they become confident (Altinay and Wang, 2011):

H3. Information technological turbulence influences the relationship between risk-taking behavior and firm performance.

Research method

This study proposes a structural equation model to determine the relationship between risk-taking behavior, which emerged from both measurement and fundamental literature. This study uses a multivariate statistic method to determine the relationships of the latent variables. In designing the model, this study draws upon previous studies, while the measurements come from a survey that was used to collect primary data.

The measures

There are four latent variables, which consist of risk-taking behavior, firm performance, pricing capability and information technological turbulence. The measures for each construct adopted subjective measures, which became the research strategy to overcome the poor viable capacity or disclosure of private financial information from SMEs. Many SME owners do not produce accounting reports and instead only prepare for an individual return or business taxation (Sheppard and Radulovich, 2010). The respondents were encouraged to rate the questions on seven-point Likert scales, with the lower score denoting a lower level of agreement with a particular statement, while higher score indicated the contrary deal.

The variable of risk-taking behavior was adapted from Covin and Wales (2012) and Lumpkin *et al.* (2009). Initially, there were eight measures of risk-taking behaviors. That includes six questions: "a strong proclivity for a high-risk project," "bold and widening acts," "financing for a new business," "business without adequate resources," "high growth in business even during uncertainty" and "quick to spend money on a potential solution." There were also two reverse questions that highlight "wait-and-see posture to minimize the risk" as reverse questions, and "study a problem before deploying resources."

The measures of performance concerns on firm performance, which comes from Schilke (2014). That involves sales growth performance relative to competitors, return on asset, return on investment, and return on sales over the past three years. The measures of information technological turbulence consist of five items, which were adapted from Pratono (2018) and Zhang and Duan (2010). That includes "rapid change," "technological breakthrough," "generate new idea" and "provide big opportunities."

This study made reference to the work of Morgan (2009) to measure pricing capability The latent variable fall into five items: "pricing skill," "effective pricing," "monitoring competitors' pricing" and "respond to competitors' pricing tactics." According to the previous literature, an asset may be difficult for SME owner-managers to observe directly, the measures were encouraged to use a standard Likert-type with anchors of strongly disagree and strongly agree (Morgan *et al.*, 2009).

Pilot test

This study carried out a pilot test with the aim to calibrate the questionnaire. This activity concerned with assessing the translated questionnaires to make sure that the respondents understand the questionnaires and easy to fill in. This activity was valuable not only to review the administration of the survey and identify the response of the target group but also to evaluate if there are any significant differences due to item wording (Schweizer *et al.*, 2011). The respondents were expected to be able to understand and fill in the questionnaires between 20 and 30 min.

The pretest activity involved some certified translators in making sure that the questionnaires meet the ability of respondents to participate. Hence, some questions were adapted or calibrated after the pilot test according to their suggestion. During the test, there are four terms, which was explored: "wait-and-see posture," "technological breakthrough" and "pricing tactics." In the second phase of the pilot test, the questionnaires were distributed to 100 respondents with random selection sample through the mail. After a week, the researcher followed up and brought the questionnaires back. Hence, the research considered 35 respondents who gave responses. This step was followed by a reliability test with Cronbach's alpha to ensure data consistency.

Data collection

To understand the behavior of SMEs, we concerned to gain information from the owner-managers of the observed SMEs instead of the workers for some reasons. First, owner-managers' attitudes regarding risk-taking determine the measurement of a firm's entrepreneurial strategy (Gloss *et al.*, 2017). Secondly, many small firms in the observed area are self-employees. The series of the financial crisis (1998 and 2008) have brought the workers laid off from formal sector and entered the informal sector (Rothenberg *et al.*, 2016).

For data population, this study focused on small businesses in which the Indonesian Ministry of Cooperative and Small Medium Enterprise provided SME directory. The definition of SMEs in the directory followed the Indonesian Law No 20/2008, which sets three groups of SMEs, micro, SMEs. Firms are considered to be the micro enterprises if they have sales less than Rp300m and asset less than Rp50m. The small business is a firm with asset between Rp50m and Rp500m as well as transactions between Rp300m and Rp2.5bn per annum, while medium enterprise is a firm with annual sales from Rp2.5bn to Rp50bn. Hence, this study employed surveyors that contacted the owner-managers from 1,000 firms, which randomly selected from SME directory the Indonesian Ministry of Cooperative and Small Medium Enterprise provided. The survey was carried out between 2015 and 2016 in Jakarta and Surabaya City, the two largest cities in Indonesia. Hence, there were 390 usable responses, reflecting a response rate of 38 per cent, which was consistent with comparable studies using the similar methodology (Kapoor and Lee, 2013).

This study sent the mail survey with anonymity to the targeted respondents. This approach names a self-administration model, which was preferable since the absence of a human interviewer increases the willingness to provide honest answers (Chang and Krosnick, 2010). Instead of conducting a face-to-face interview, the survey preferred to encourage the respondents to fill in the anonymous questionnaire, which was believed that the targeted respondents answered the questionnaires with a more accurate answer.

Analysis

This study used the partial least square (PLS) technique for some reasons. First, PLS can handle developing hierarchical complex models due to the flexibility of soft modeling assumption for validating a reflective-formative, hierarchical quality model (Akter *et al.*, 2017). PLS is relevant for exploratory research questions with weak theoretical basis (Nitzl, 2016).

Second, the PLS has capability to deal with variables measured on interval scales which applied to ordinal data (Cantaluppi and Boari, 2014), including the formative measured constructs, the complex structural model, and the non-normal data (Schloderer *et al.*, 2014). PLS-structural equation modeling is a nonparametric method that has the ability to work with ordinary scale data and easily incorporate both reflective and formative measurement models (Hair *et al.*, 2017).

Finally, PLS is a popular path modeling technique commonly to understand the latent phenomena such as firm behavior, attitudes or intention and their influence on organizational performance (Dijkstra and Henseler, 2015). The use of PLS method has been increasing importance from human resource management to information system research (Hair *et al.*, 2017), which not only confirm the high relevance of the PLS for business studies but also reveal the variation in the way PLS is applied (Ringle *et al.*, 2018).

To deal with the heterogeneity of the observed respondents, this study examines the various level of IT technological turbulence. The structural equation model was examined by analyzing the moderating effects (Schloderer *et al.*, 2014). This study used the interaction term, which is one of the PLS developed techniques for modeling data from heterogeneous populations (Rigdon *et al.*, 2010). This involved the interaction term as an additional latent variable, which consists of technological turbulence as an exogenous variable and dependent variable.

Results

Table I shows that the most respondents consider their firms as risk takers. For firms with asset less than IDR50m, 79 per cent respondents believe that their firms are risk takers. Similarly, there are 63 per cent respondents, which belong to the criteria of asset IDR50 and IDR500m and 77 per cent respondents with firms' asset more than IDR500m.

From the sales perspective, there were 73 respondents that asserted that their firms are risk takers. For those with sales between IDR2.5 and IDR50bn, 85 per cent respondents contended that their firms tend to take high risk and very high risk. This result also occurs from education background of respondents, who are mostly owner-managers of SMEs. The higher their education background, the higher risk their firms.

The reflective measurement models require an internal consistency and convergent validity. This study uses average variance extracted (AVE) to examine the convergent validity. Table II shows that the values of AVE varied between 0.7 and 0.8, which indicates that the specific constructs share a high proportion of variance. The outer loadings also demonstrate that the associated indicators have commonality with values greater than 0.7 (Table AI). To assess the discriminant validity, this study used the heterotrait-monotrait

Risk		1	2	3	4	5	6	7	Total
Firm assets									
Less than IDR50m	1	0	1	3	2	9	5	8	28
Between IDR50 and 500m	2	6	4	11	24	22	33	20	120
Between IDR500 and 10bn	3	8	8	15	24	55	73	59	242
Total		14	13	29	50	86	111	87	390
Sales									
Less than IDR300m	1	3	3	6	12	20	17	15	76
Between IDR300m and 2.5bn	2	11	9	22	32	47	70	61	252
Between IDR2.5 and 50bn	3	0	1	1	6	19	14	11	52
Total		14	13	29	50	86	101	87	380
Respondents' education									
Middle school	1	4	1	2	0	4	4	2	17
High school	2	8	8	20	27	49	58	58	228
College	3	2	4	7	21	31	43	27	135
Post-graduate	4	0	0	0	2	2	6	0	10
Total		14	13	29	50	86	111	87	390

Table I.
Respondent profiles

ratio of correlations (HTMT). Table AII shows that the HTMT values are below 0.90, which indicates that discriminant validity occurs. The results confirm that hypothesized structural paths are real.

As the traditional criterion for internal consistency, Table II shows that the coefficients of Cronbach's alpha of the latent variables are between 0.7 and 0.9, which indicate a higher level of reliability. The coefficients of CR varied between 0.6 and 0.7, which are generally interpreted as CA that are acceptable in exploratory research. A value above 0.95 is not expected because it indicates the same phenomenon, which is unlikely to be a valid measure (Hair *et al.*, 2017).

Hence, it is essential to ensure that there is no collinearity problem, which implies on bias estimation. The selected constructs have tolerated value of VIF, which is between 0.20 and 5.0. The VIF test examines both inner model and outer model. The inner model shows that each latent variable has VIF value between 1.3 and 1.6, while the items have VIF values between 1.4 and 2.9 (Table III).

This study also pertains the Fornell–Lacker criterion and cross-loading to assess discriminant validity. Table IV demonstrates that the reflective construct of firm performance has a value of 0.809 for the square root of its AVE. This value is higher than the correlation of the construct with other latent variables. Other reflective measures also

Table II.
Construct reliability and validity

Latent variables	Cronbach's alpha	Rho_A	Composite reliability	AVE
FP	0.912	0.915	0.93	0.654
IT turbulence	0.883	0.885	0.915	0.683
Pricing capability	0.822	0.829	0.881	0.649
Risk taking	0.707	0.768	0.869	0.768
Risk × IT turbulence	1.000	1.000	1.000	1.000

Table III.
Measures, outer loading and multicollinearity test

Variables	The measures	Outer loading	VIF
Risk1	To deal with uncertainty, my firm typically adopts a cautious, "wait-and-see" posture to minimize the risk (R)	0.830	1.425
Risk2	The managers of my firm prefer to study a problem thoroughly before deploying resources to solve it (R)	0.921	1.425
IT01	The IT in our industry is changing rapidly	0.802	2.226
IT02	The IT changes in our industry provide big opportunities in our business	0.811	2.219
IT03	A large number of new product ideas have been made possible through technological breakthrough in our industry	0.881	2.903
IT04	IT changes in our industry generate new ideas for product supply	0.785	2.173
IT05	IT changes in our industry generate new ideas for service supply	0.848	2.406
FP01	Sales growth performance during past three years	0.770	2.527
FP02	Sales growth relative to direct competitors	0.835	2.827
FP04	Gross profit in the past three years	0.779	2.213
FP05	Return on asset (ROA)	0.763	2.262
FP06	Return on investment (ROI)	0.826	2.763
FP07	Return on sales (ROS)	0.833	2.609
FP08	Overall performance in the past three years	0.851	2.716
PC01	Our firm uses pricing skills and systems to respond quickly to market changes	0.816	1.818
PC03	Our firm is doing an effective job of pricing products/services	0.804	1.794
PC04	Our firm monitors competitors' price changes	0.828	2.699
PC05	Our firm quickly responds to competitors' pricing tactics	0.774	2.491

have higher values for the square root of AVE than the correlation of the constructs with other latent variables, i.e. IT turbulence (0.826), pricing capability (0.806) and risk taking (0.876). Once the construct measures are confirmed to be reliable and valid, the next step involves examination of the structural model result (Henseler *et al.*, 2015).

The algorithm calculation provides the estimation of loading and weights for the relationships in the measurement models and the path coefficient for the structural model. The three constructs jointly explain 57.3 per cent of the variance of the endogenous construct (R^2 = 0.573), as the risk-taking behavior explains 35.4 per cent. They are all statistically significant with the *p*-value of less than 1 per cent (Figure 1). The result shows that the significant effect of risk-taking behavior on firm performance *t*-statistic 9.196 and the *p*-value less than 1 per cent, which indicates that *H1* that the positive impact of risk-taking behavior on firm performance is accepted with a coefficient at 0.201 (Figure 1).

Latent variables	FP	IT turbulence	Pricing capability	Risk taking	Risk × IT turbulence
FP	0.809				
IT turbulence	0.559	0.826			
Pricing capability	0.646	0.453	0.806		
Risk taking	0.581	0.389	0.595	0.876	
Risk x IT turbulence	–0.490	–0.191	–0.501	–0.443	1.000

Table IV.
Fornell–Larcker criterion

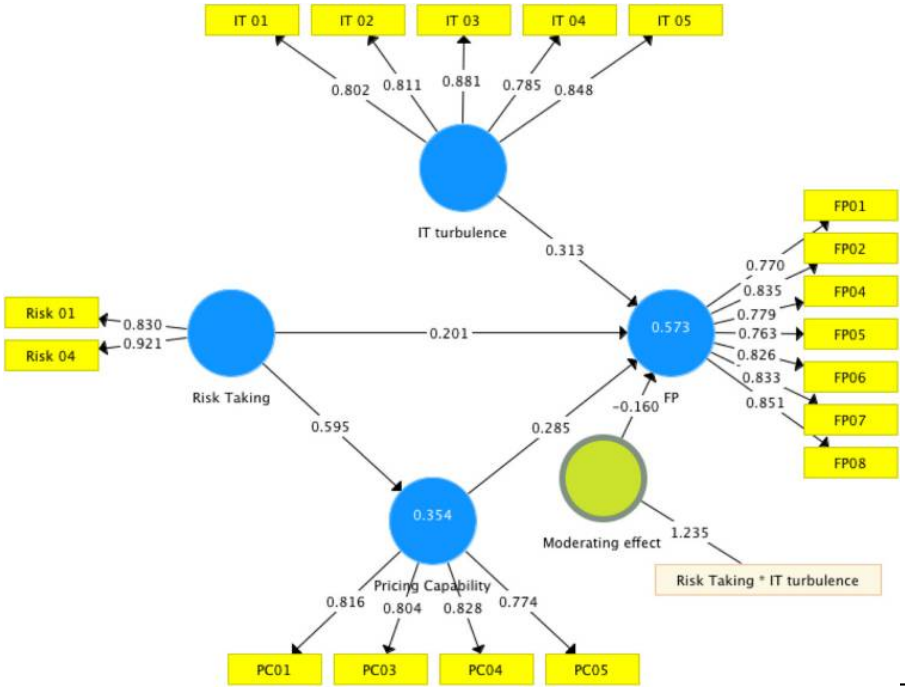

Figure 1.
Path analysis

The results also confirm that *H2* is accepted, as each path is significant with the *p*-value less than 1 per cent. The coefficient of risk-taking behavior on pricing capability is 0.592 with the *t*-statistics 13.181 and the *p*-value of less than 1 per cent, while the coefficient of pricing capability is 0.285 with *t*-statistics 6.387 and *p*-value less than 1 per cent. The variance accounted for (VAF) demonstrates the size of the indirect effect to the total effect: (p12*p23)/(p12*p23+p13) = (0.595*0.285)/(0.595*0.285 + 0.201) = 0.1695/0.371 = 0.4568. This indicates that pricing capability provides a partial mediating effect on the relationship between risk-taking behavior and firm performance, as the VAF value is between 20 and 80 per cent (Table V).

H3 is acceptable as both information technological turbulence and interaction term have a significant impact on firm performance with *t*-values 6.387 and 5.018, respectively. The result indicates that technological turbulence affects the substantial effect of risk-taking behavior on firm performance. The high technological turmoil slithers the slope of risk-taking behavior on firm performance. The moderating impact provides information that the relationship between risk-taking behavior and firm performance changes, depending on the information technological turbulence (Figure 2).

Theoretical implication

This study extends the traditional view that the high-risk have the potential to offer the high return by introducing information technological turbulence as a moderating variable. The results do not only support to the previous literature that risk-taking behavior has the positive effect on firm performance (Willebrands *et al.*, 2012; Situmeang *et al.*, 2016) but also

Table V.
Bootstrapping total effects

Latent variables	Original sample	Sample mean	SD	*t*-statistics	*p*-values
IT turbulence → FP	0.313	0.316	0.033	9.524	0.000
Pricing Capability → FP	0.285	0.288	0.045	6.387	0.000
Risk Taking → FP	0.371	0.369	0.040	9.196	0.000
Risk Taking → Pricing Capability	0.595	0.598	0.045	13.181	0.000
Risk × IT turbulence → FP	−0.160	−0.160	0.032	5.018	0.000

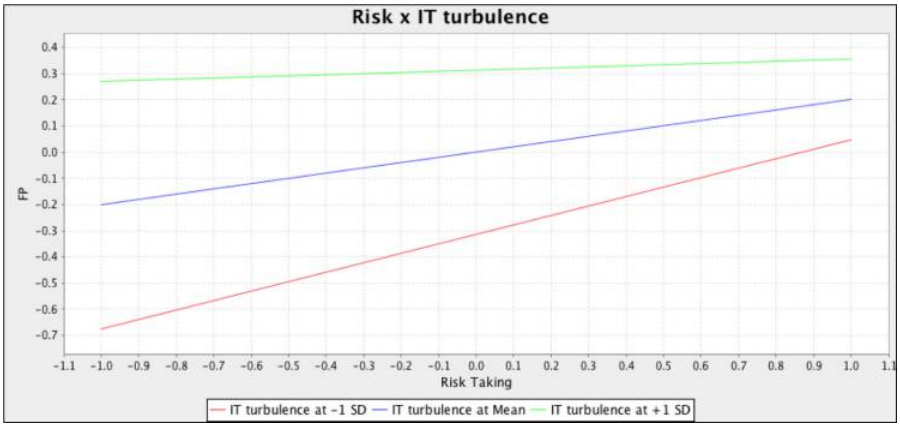

Figure 2.
Moderating effect of IT turbulence

indicate that high information technological turbulence reduces the effectiveness of risk-taking behavior on firm performance.

The results of regression with moderating variable of information technology indicate that the effect of risk-taking behavior on firm performance is less effective under high information technological turbulence. The result confirms the work of Shin and Lee (2013), which argues that SMEs should consider the low-risk technological arbitrage opportunities in mature technologies, which extends the discussion on why firms take a risk by making a decision to adopt a highly speculative technology with a small probability of achieving significant commercial success, while other firms remain to pursue the old technology (Ross, 2014).

This study extends the previous studies regarding the risk of technological turbulence. This is different from the previous studies, which argue source of risk for SMEs typically comes from demand fluctuation (Mourougane, 2012). The results extend the discussion under which that SMEs with risk-taking behavior can achieve performance under the various level of information technological turbulence. Hence, the firms are encouraged to establish risk governance orientation to be more viable and sustainable for the future (Stein and Wiedemann, 2016). Technological turbulence makes the past successful experience invalid and irrelevant for future practices (Zhang and Duan, 2010). It needs to consider performance impact of technological capability for firms whose strategic position is based on both competence and complementary capabilities (Mani and Nandkumar, 2016).

In addition, pricing capability offers an explanation to clarify how firms with risk-taking behavior achieve the performance. The significant impact of mediating variable posits a description of the relationship regarding an intervening variable that plays a role as receiving the result from risk-taking behavior as an exogenous construct and translating it into the firm performance. SMEs with robust risk-taking behavior will be able to gain an advantage by generating pricing capability, which in turn allowing SMEs to achieve excellent performance. This result gains support from the previous study, which argues that risk-taking governance is associated with a capability to establish the price (Dai and Meng, 2015). This study also contributes to the capability theory, which argues that price capability becomes the main issue for SMEs (Branguinsky and Hounshell, 2016).

The results indicate that SMEs will have pricing capability by taking a risk. To deal with IT turbulence occurs, it is essential to becoming rigorous in analyzing and evaluating risk. SMEs need the capability to identify appropriate low-risk technological opportunities. Many firms associate risk governance with compliance-driven work, such as annual IT security system, which may not be relevant to SMEs. Firms need to enhance the capability of their employees to incorporate risk governance when making a decision.

Managerial implication

Most of the observed SMEs believe that taking risks is essential for firm performance. However, IT turbulence creates more anxiety about the consequences of risk-taking behavior. Social relationship plays a pivotal role for SMEs' decision-making process and bank preference to support their business opportunities (Hill and Scott, 2015). Risk governance needs to adopt the social information systems, which help firms to identify when they should shift in strategy (Limaj *et al.*, 2016). Hence, the risk governance for SMEs needs to be developed with various scenarios that spring from a different level of information technological turbulence, which allows the firms to impose a more prudential policy under high technological turmoil or to take the initiative to exploit business opportunities under moderate technological turbulence.

Secondly, this study also argues that pricing capability explains how a firm can transform risk-taking behavior to firm performance. As pricing capability plays a pivotal

role in firms' competitiveness (Gonçalves and Barros, 2013), price strategy should be developed based on a strong risk governance culture (Dai and Meng, 2015). The result encourages firms to build risk governance, which can help the firms to develop a price strategy by involving a various level of risk. Firms need to encourage risk-taking behavior by creating a risk-friendly environment in strong environmental turbulence. Hence, SME owner-managers should equip their decision-making system with conventional levels of risk awareness.

SMEs need to develop the formal policy the policy, which is essential to create the specific level of risk awareness (Al-Najjar, 2015). This allows the system is shared quickly and openly across the business networks. Firms require developing an organizational environment for risk-taking and learning from intermittent failure. It is clear that there should minimalize execution risk regarding firm performance, but encourages discovery risk to deal with IT turbulence. Risk managers may rely on tools, training and workshop series, which help employees to assess the risk. In SME governance practice, the patterns of trust between SMEs' managers change over time as the working relationships rely on the "knowledge-based" level of confidence (Boxer *et al.*, 2012).

Limitation and further studies

This study has attempted to conduct the mail survey with anonymity, which was believed that the targeted respondents would answer the questionnaires with a more accurate answer. In-self administration mode was preferable as the absence of a human interviewer was expected to increase willingness to provide honest answers (Chang and Krosnick, 2010). However, this approach did not work very well with a result of low response rate. Hence, some technical approaches were employed, such as providing incentives and involving some business associations to encourage their members to participate. This calls for further analysis to examine the objectivity of the respondents.

Gaining support from the business associations was effective to encourage the targeted respondents, who previously refused to participate in the last survey round. The technical approaches may be efficient to improve response rates, primarily when there was no contingency with the completion of the questionnaire (Sánchez-Fernandez *et al.*, 2010). However, this raises important questions about the effectiveness of the technical approaches to increase the response rate. Future researchers need to draw a distinction between a survey where technical procedures were adopted and those where it comes with the in-self administration. There is also possible research on the contingency effect on the various technical methods to increase the response rate, especially on observed the organizations with high-risk behavior.

Second, it is important to note that this study gained support from the owner-managers of SMEs, who were much more involved in the decision-making process than the employees. Many firms associate risk governance with compliance-driven work, such as annual IT security system, which may not be relevant to SMEs. Firms need to enhance the capability of their employees to incorporate risk governance when making a decision. Risk managers may rely on tools, training and workshop series, which help employees to assess the risk. Hence, the future study needs to explore how this process can assist employees in a decision-making process. We also encourage future researchers to further examine from employees' perspective, which may imply the different impact of risk-taking behavior, as the small firms are associated with dense informal workers.

Finally, this study was conducted at Indonesia, which was considered to be an emerging market economy. The emerging markets may continue to represent the performance benefit through risk reduction (Buchanan *et al.*, 2011). To generalize the result, future studies are encouraged to explore risk-taking behavior in different context. Exploring risk-taking

behavior in various settings may evoke potential studies of heterogeneity, which involves multiple moderating variables, such as gender, culture or religion.

Despite these limitations, we believe that this study contributes to helping risk governance researchers discern the unobserved heterogeneous effect of risk-taking behavior. We expect that this study encourages more researchers to develop the novel extension to understand the complicated relationship between risk-taking behavior and firm performance. Hence, it is a growing need to understand the antecedents of the risk-taking behavior during the high IT turbulence.

Conclusion

This study gives an account of entrepreneurial behavior and provides empirical evidence to confirm that risk-taking behavior positively affects firm performance. Given that risk governance is not confined to the traditional practices, this study advances the previous works on risk-taking behavior at the firm level in IT turbulence. This study likes to point out that the various conditions of IT turbulence lead to the different impact of risk-taking behavior on firm performance. The results also support the claim that the initiative to adopt risk-taking behavior sets off a strong pricing capability, which brings about firm performance. Using risk governance as the conceptual lens, this study pertains the mediating role of pricing capability to a better understanding of the complicated relationship between risk-taking behavior and firm performance.

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Appendix

Table AI.
Outer loading

	Firm performance	IT turbulence	Pricing capability	Risk taking behavior
Risk 01				0.830
Risk 02				0.921
IT01		0.802		
IT02		0.811		
IT03		0.881		
IT04		0.785		
IT05		0.848		
FP01	0.770			
FP02	0.835			
FP04	0.779			
FP05	0.763			
FP06	0.826			
FP07	0.833			
FP08	0.851			
PC01			0.816	
PC03			0.804	
PC04			0.828	
PC05			0.774	

Table AII.
Heterotrait-monotrait ratio (HTMT)

	Firm performance	IT turbulence	Pricing capability	Risk taking behavior
IT turbulence	0.618			
Pricing Capability	0.727	0.528		
Risk Taking	0.7	0.471	0.806	
Risk x IT turbulence	0.538	0.263	0.532	0.502

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